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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Fumiaki Kikui

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EXAMINER

QUINTO, KEVIN V

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/574,603	<b>Applicant(s)</b> KIKUI ET AL.	
	<b>Examiner</b> Kevin Quinto	<b>Art Unit</b> 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed November 28, 2007 have been fully considered but they are not persuasive. The applicant's remarks regarding the use of inorganic materials in the method of making the substrate (p. 6 of the response) as disclosed in the specification have not been found to be persuasive since the claims are directed to a substrate and not its fabrication process. Furthermore the remarks concerning the use of organic materials in the Hayashi reference (USPN 5,527,604), particularly "The insulating layer including resins cannot be used for a wiring board which needs to have a heat resistance of 500°C or more" are not persuasive since only a substrate is claimed. The applicant also argues that the particles disclosed by Hayashi are not needle particles. However the applicant's current specification (p. 8, lines 15-16) describes the needle particle as "a particle that has a major axis and a minor axis and has an elongated shape just like a needle." The particles (4) of Hayashi in figure 2 meet this description therefore the rejection stands.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claims 1, 7, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayashi (USPN 5,527,604).

4. In reference to claim 1, by Hayashi (USPN 5,527,604) discloses a structure which meets the claim. Figure 2 of Hayashi discloses a substrate comprising a metal plate (20) and an insulating film (2) which is provided on the surface of the metal plate (20). The insulating film (2) consists essentially of needle alumina particles (4) and granular particles (5).

5. With regard to claim 7, Hayashi discloses that the film has 50 mass% in needle alumina particles (column 7, lines 63-67, column 8, lines 12-13).

6. In reference to claim 10, Hayashi discloses (column 5, lines 62-63) the use of Fe, Cu, and Al as the metal plate.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi (USPN 5,527,604) in view of Funada et al. (USPN 6,232,398 B1).

9. In reference to claims 2 and 3, Hayashi does not disclose the use of silica or TiO<sub>2</sub> particles. However Funada et al. (USPN 6,232,398 B1, hereinafter referred to as the "Funada" reference) discloses that silica and titanium oxide particles are materials that

are well known for their use in substrates since they have high heat conductivity (column 5, lines 35-38). Hayashi discloses that this is a desirable property for the granular particles (column 4, lines 30-33). In view of Funada, it would therefore be obvious to use silica or  $\text{TiO}_2$  particles in the Hayashi structure.

10. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi (USPN 5,527,604) in view of Yamaguchi et al. (United States Patent Application Publication No. US 2004/0266913 A1).

11. In reference to claims 2 and 3, Hayashi does not disclose the use of silica or  $\text{MgO}$  particles. However Yamaguchi et al. (United States Patent Application Publication No. US 2004/0266913 A1, hereinafter referred to as the "Yamaguchi" reference) discloses that silica and magnesium oxide particles are materials are well known for their heat conductive property (p. 3, paragraph 33). Hayashi discloses that this is a desirable property for the granular particles (column 4, lines 30-33). In view of Yamaguchi, it would therefore be obvious to use silica or  $\text{MgO}$  particles in the Hayashi structure.

12. Claims 4, 5, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi (USPN 5,527,604).

13. In reference to claim 4, Hayashi does not disclose the exact ratio (6 to 15) as that claimed by Applicant. However:

"[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)

Therefore claim 4 is not patentably distinguishable over the Hayashi reference.

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14. With regard to claim 5, Hayashi does not disclose the exact major-axis length (70 nm to 300 nm) as that claimed by the Applicant. However:

"[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)

Therefore claim 5 is not patentably distinguishable over the Hayashi reference.

15. With regard to claim 6, Hayashi does not disclose the exact mean particle size (5 nm to 80 nm) as that claimed by the Applicant. However:

"[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)

Therefore claim 6 is not patentably distinguishable over the Hayashi reference.

16. In reference to claim 8, Hayashi teaches all of the claimed invention except for the exact thickness of the insulating film. Hayashi has a thickness of 120  $\mu\text{m}$  (column 8, Table 2). Although Hayashi does not teach the exact thickness as that claimed by Applicant:

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

The shape, size, dimension differences are considered obvious design choices and are not patentable unless unobvious or unexpected results are obtained from these changes. It appears that these changes produce no functional differences and therefore would have been obvious. Note *In re Leshin*, 125 USPQ 416.

Therefore claim 8 is not patentably distinguishable over the Hayashi reference.

17. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi (USPN 5,527,604) in view of Murata et al. (United States Patent Application Publication No. US 2002/0003261 A1).

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18. In reference to claim 9, Hayashi does not disclose the specific roughness claimed by the applicant. However Murata et al. (United States Patent Application Publication No. US 2002/0003261 A1, hereinafter referred to as the "Murata" reference) discloses that adjusting the roughness of an alumina surface for a substrate is well known in the art (p. 1, paragraph 11). Thus Murata makes it clear that the roughness is a result effective variable. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to adjust the thickness of the well layer, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore claim 9 is not patentably distinguishable over the Hayashi and Murata references.

19. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi (USPN 5,527,604).

20. In reference to claim 11, Hayashi teaches all of the claimed invention except for the exact thickness of the metal plate. Although Hayashi does not teach the exact thickness as that claimed by Applicant:

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

The shape, size, dimension differences are considered obvious design choices and are not patentable unless unobvious or unexpected results are obtained from these changes. It appears that these changes produce no functional differences and therefore would have been obvious. Note *In re Leshin*, 125 USPQ 416.

Therefore claim 11 is not patentably distinguishable over the Hayashi reference.

***Conclusion***

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quinto whose telephone number is (571)272-1920. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KVQ

/A. Sefer/  
*Primary Examiner*  
*Art Unit 2826*